A NEW SPECIES OF *DIRLA* NAVAS (PSOCOPTERA: CALOPSOCIDAE) WITH COMMENTS ON THE POSITION OF THE GENUS

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The Australian Museum, 6-8 College Street, Sydney, 2000.

Abstract

A new species, *Dirla pulleni*, is described from New Guinea and the position of *Dirla* in the Calopsocidae confirmed.

Introduction

Dirla Navas is one of five genera included in the Calopsocidae. Little information had been published on it since the somewhat meagre description of the single specimen of the type species, *D. javana* Navas (Navas 1924), until New (1978b) described two more species. He also provided (New 1977) a redescription of the female of *Callistoptera* Enderlein (the male is still not known) and has described and given a key to the three known species of *Neurosema* McLachlan as well as a key to the genera of Calopsocidae (New 1978a) adding the fifth genus, *Nemupsocus* New (1978b) for a single New Guinea species.

Material of a fourth species of *Dirla*, the second from New Guinea, is described here. The position of the family has been discussed (Smithers 1967) on the basis of *Calopsocus* Hagen.

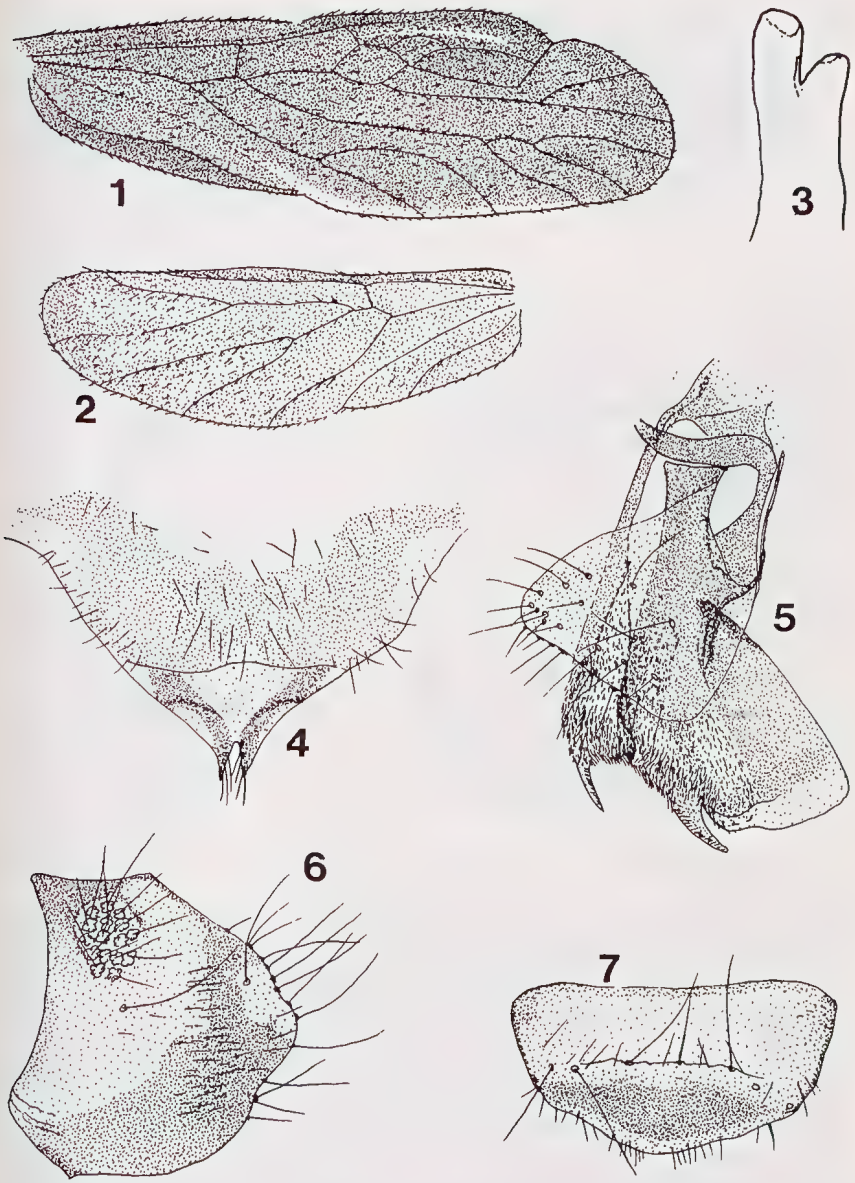
Dirla pulleni sp. n.

(Figs 1-12)

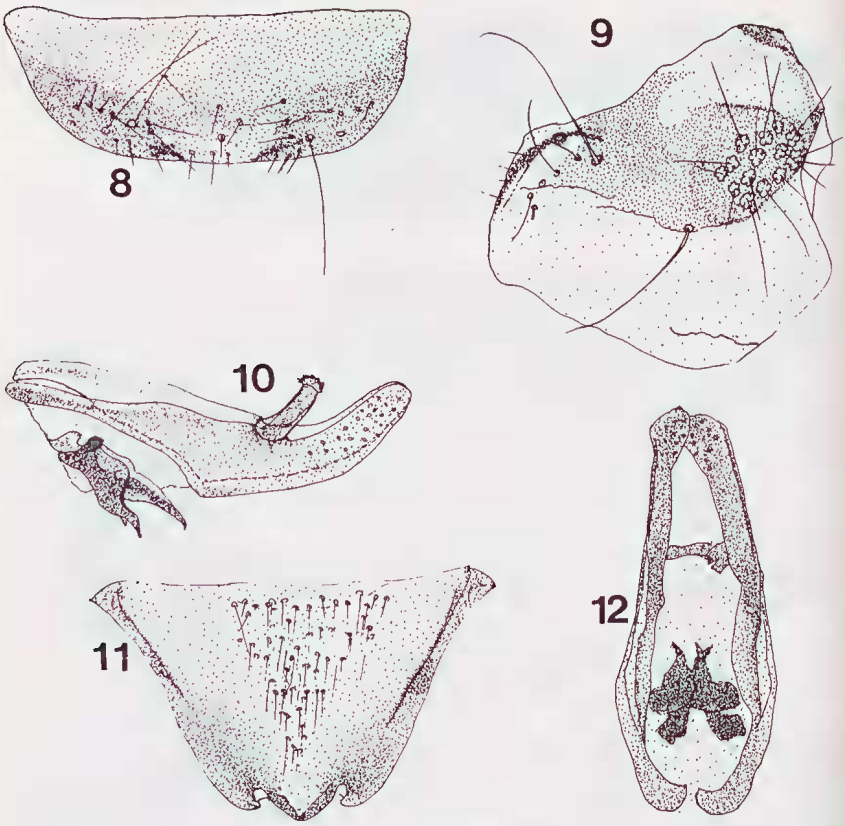
FEMALE

Coloration (pinned specimen). Head red with a small yellow patch dorsad of each antenna base. Epicranium a little darker red than rest of head. Labrum red. Scape and pedicel red; first flagellar segment yellowish except for almost black tip, setae correspond in colour to segment colour; second, third and fourth flagellar segments black with very long, dense, black pubescence; remaining flagellar segments black with black setae but segments shorter and setae less dense. Eyes black. Ocelli pale, tubercle red. Maxillary palp reddish with black distal half of fourth segment. Thorax and legs reddish brown, tips of tibiae and first tarsal segments black, second segment wholly black. Fore wings (Fig. 1) with membrane mostly brown, a narrow pale border along hind margin from M_1 to nodulus, the pale area a little wider towards nodulus than distally; very narrow pale area borders divergence of R_{2+3} from R_{4+5}. Veins dark brown. Hind wing (Fig. 2) paler brown than fore wing. Abdomen very dark brown, almost black.

Morphology. Length of body not measured owing to collapsed state of abdomen. Median epicranial suture distinct. Vertex with a few erect setae. Postclypeus not very bulbous. Antennae arise from small cup-shaped protuberances. Length of flagellar segments: f_1 : 1.36 mm; f_2 : 0.92 mm. Setae of middle region of antenna, i.e. flagellar segments 2, 3 and 4, very long giving a narrow "bottle brush" appearance to the antenna. Eyes large, just reaching level of



Figs 1-7. *Dirla pulleni* sp. n. ♀. (1) fore wing; (2) hind wing; (3) lacinia; (4) subgenital plate; (5) gonapophyses; (6) paraproct; (7) epiproct.



Figs 8-12. *Dirla pulleni* sp. n. ♂. (8) epiproct; (9) paraproct; (10) phallosome, left lateral view; (11) hypandrium; (12) phallosome, dorsal view.

vertex. IO/D (Badonnel): 2.2; PO: 0.9. Ocelli small, tubercle hardly developed. Outer margin of mandible semicircular. Lacina (Fig. 3). Claws with preapical tooth; pulvillus broad. Legs very hairy. Measurements of hind leg: F: 1.36 mm; T: 2.32 mm; t_1: 0.64 mm; t_2: 0.20 mm; rt: 3.2: 1; ct: 19, 2. Fore wing length: 6.7 mm; width: 2.1 mm. Fore wings slightly curved longitudinally. Anterior margin notched at distal end of pterostigma at which point wing has a transverse fold along distal margin of pterostigma into spur vein. Costa broken at base of pterostigma and at distal fold. Sc absent. Rs recurrent at base. Rs and M fused for a very short length. Secondary veins restricted to area behind pterostigma. Margin, veins and wing membrane setose. Hind wing length: 5.1 mm; width: 1.7 mm. Rs recurrent at base, Rs and M branched, the branches somewhat sinuous; Rs and M fused for a short length. Epiproct (Fig. 7) short, heavily sclerotized, with a row of long setae across middle and a setose slightly curved hind margin. Paraproct (Fig. 6) well sclerotized, broad, with a circular field of

large trichobothria with one long adjacent seta and a row of smaller setae; a few small setae occur on distal half of paraproct those nearer hind margin longer. On its internal face there is a field of small setae arising from large alveoli. Gonapophyses (Fig. 5) well sclerotized; ventral valve divided, strongly spiculate in distal half; dorsal valve very broad with apical, ventral spur, strongly spiculate; external valve well developed, setose. Ninth tergite well sclerotized. Subgenital plate (Fig. 4) well sclerotized, extended posteriorly by a strongly sclerotized, apically setose, lateral bar on each side between which the plate is membranous; the bars converged posteriorly.

MALE

Coloration (pinned specimen). As female but with first flagellar segment black.

Morphology. Length of body not measured owing to collapsed state of abdomen. Median epicranial suture distinct. Vertex rounded with sparse, erect setae. Postclypeus hardly bulbous. Antennae without excessive development of setae on second to fourth flagellar segments. Eyes large, just reaching above level of vertex. IO/D (Badonnel): 0.8; PO: 1.3. Ocelli small, tubercle hardly developed, anterior ocellus much smaller than lateral ocelli. Length of flagellar segments: f_1: 1.4 mm; f_2: 0.096 mm. Lacinia as in female. Measurements of hind leg: F: 1.32 mm; T: 2.36 mm; t_1: 0.64 mm; t_2: 0.20 mm; rt: 3.2 : 1; ct: 22, 2. Fore wing similar to that of female but smaller. Fore wing length: 5.7 mm; width: 2.0 mm. Hind wing length: 4.2 mm; width: 1.5 mm. Epiproct (Fig. 8). Paraproct (Fig. 9). Hypandrium (Fig. 11). Phallosome (Figs 10, 12).

MATERIAL EXAMINED. NEW GUINEA: 1 ♀ (holotype), Western Highlands, Jimi River, 1600 m, 16.vii-21.ix.1961, W. W. Brandt; 2 ♂ (allotype and paratype), Daimandi, 1200 m, Finisterre Range, Madang Centr. Subdistr., x.1964, R. Pullen. Holotype ♀, allotype ♂, in Australian National Insect Collection; ♂ paratype in Australian Museum.

Discussion

The description of *Dirla javana* is fairly brief but *D. pulleni* clearly differs from it in being much larger, in having the costal margin of the fore wing more strongly curved at the pterostigma, in having the fore wings more elongate and, in the hind wing, the bifurcation of M much closer to the wing base than the bifurcation of Rs. Genitalia of *D. javana* have not been described. In *Dirla furcata* New the fore wing is much broader in relation to its length than in *D. pulleni* and the phallosome sclerifications of the former are in the form of a series of long, posteriorly narrowed or pointed rods. In *D. navasi* New, known only from the female, the ventral valve of the gonapophyses is much narrower apically and the lobes of the subgenital plate rounded, not pointed. *Dirla* agrees with the other genera of the family Calopsocidae in several features. 1.—The wing membrane is setose. 2.—There are secondary veins in the fore wing although in *Dirla* these are restricted to the area immediately behind the pterostigma (i.e. between R_1 and Rs); they are less extensive than in

Neurosema and *Calopsocus* but moreso than in *Callistoptera* and *Nemupsocus*. The homologies of the veins in this area of the wing have not been critically studied in the Calopsocidae but for the present it is assumed that the vein behind the pterostigma is R_{2+3} and the fork just anterior to the wing apex is R_4 and R_5; these latter veins are not usually present as separate entities in the Psocoptera and the current interpretation may need revision. 3.–*Dirla* has a preapical tooth on the tarsal claws and a broad pulvillus [as in other Calopsocid genera except *Callistoptera* and *Nemupsocus* which lack the tooth (New 1977, 1978b)]. 4.–In males the phallic frame is broken or weakened anteriorly, the internal and external parameres are strongly upturned posteriorly and there are very strong sclerifications associated with the penial bulb. 5.–The ninth tergite of the male is very strongly sclerotized and has extensive rugose areas and a median comb along the hind margin; this comb is sometimes medially absent. 6.–In the female both the ventral and dorsal valves are divided except for the acuminate ventral valve in *Nemupsocus*. 7.–The female subgenital plate has a membranous posterior lobe which is strengthened along each side by a strongly sclerotized, apically setose bar; the lobe is attached by a membranous connection to the body of the plate. The lateral strengthening bars are very easily detached during preparation of the specimen; the sclerite attached to the gonapophyses in the illustration of *Callistoptera anna* Enderlein in New (1977, Fig. 7) is almost certainly part of a similar distal lobe of the subgenital plate as suggested by him (New 1977: 54).

When discussing *Callistoptera* New (*loc. cit.* p. 54) defined a monogeneric subfamily to contain it. *Dirla* does not conform to his definition except in having R_4 and R_5 separate in the fore wing and is, therefore, to be excluded from it. It is clear on the basis of material now available that *Dirla* should be retained in the Calopsocidae and is best retained in the Calopsocinae.

Acknowledgement

I would like to thank Mr M. S. Upton for making material of *Dirla* available for study.

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